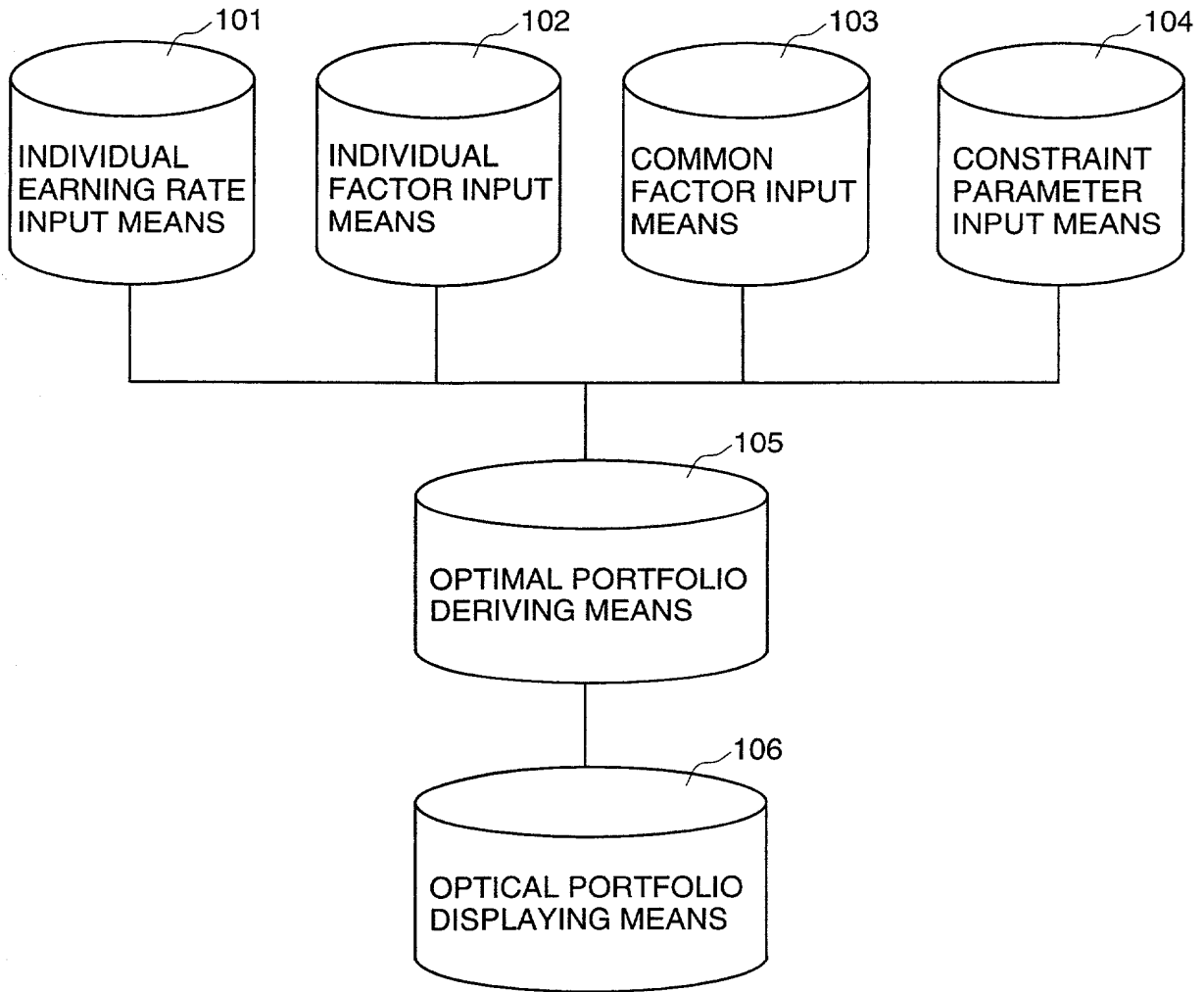


**FIG. 1**



**FIG. 2**

	EXPECTED EARNING RATE
NAME 1	0.7194
NAME 2	0.6173
NAME 3	1.0929
NAME 4	2.3438
NAME 5	-1.4706
NAME 6	0
NAME 7	0.7194
NAME 8	-1.6077
NAME 9	0
NAME 10	3.8462
:	:
:	:
:	:
NAME 1432	0.2538

**FIG. 3**

	EXPECTED EARNING RATE	EXPECTED EARNING RATE	BUSINESS CATEGORY CODE
NAME 1	31.4052	0.0000392	1
NAME 2	31.2757	0.0000663	1
NAME 3	34.0792	0.0001277	1
NAME 4	40.4041	0.0000972	1
NAME 5	41.9739	0.0000099	1
NAME 6	48.0905	0.0000086	1
NAME 7	26.485	0.0002644	1
NAME 8	37.9287	0.0001594	1
NAME 9	46.0203	0.0000376	2
NAME 10	34.8058	0.00004	2
:	:	:	:
:	:	:	:
:	:	:	:
NAME 1432	67.4541	0.0001751	29

FIG. 4

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	.....	FACTOR 13
FACTOR 1	11.1248	-2.3964	0.9343	1.06303	.....	0.45002
FACTOR 2	-2.3964	29.0085	0.36332	-2.9145	.....	-10.229
FACTOR 3	0.9343	0.36332	4.59532	-0.4776	.....	2.16089
FACTOR 4	1.06303	-2.9145	-0.4776	7.33842	.....	5.24325
FACTOR 5	1.2412	-18.82	1.77274	2.35877	.....	-6.4554
FACTOR 6	0.06092	-1.2146	-1.341	-1.4092	.....	-1.7343
FACTOR 7	0.66805	1.11355	0.24439	2.47768	.....	0.42619
FACTOR 8	1.32408	-0.5646	0.07054	0.67178	.....	-0.7963
FACTOR 9	0.21797	0.25349	0.10934	0.2885	.....	-0.6543
FACTOR 10	0.20325	-2.2026	-0.2885	2.91562	.....	3.28909
FACTOR 11	-0.6936	1.94818	0.55252	-0.0362	.....	0.77317
FACTOR 12	0.72795	0.34404	1.37416	0.78549	.....	-0.1364
FACTOR 13	0.45002	-10.229	2.16089	5.27069	.....	75.6235

FIG. 5

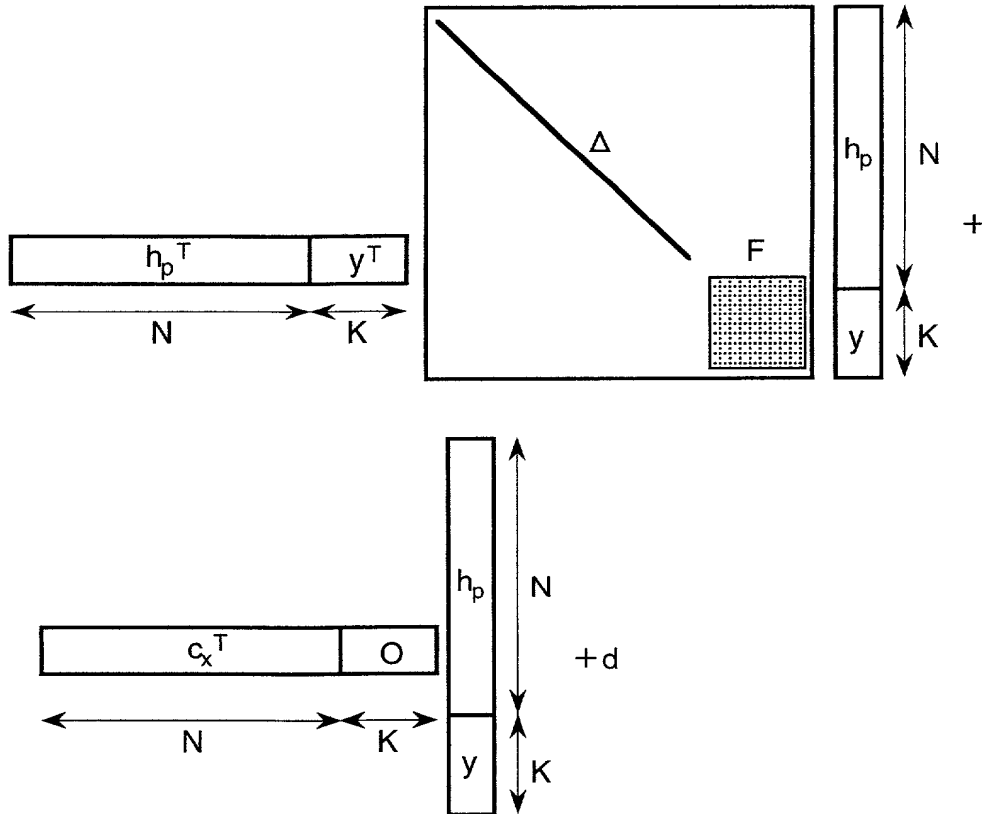
	FACTOR 1	FACTOR 2	FACTOR 3	.....	FACTOR 13
NAME 1	-1.2079	-2.55481	1.911955	.....	1.628134
NAME 2	-0.99	-1.84682	2.581261	.....	0.466797
NAME 3	1.30356	-1.72684	2.661661	.....	1.676943
NAME 4	0.076017	-1.78249	1.972969	.....	0.005749
NAME 5	-0.79037	-2.42233	1.970481	.....	0.016373
NAME 6	-1.34568	-3.22172	0.285957	.....	0.172875
NAME 7	-1.90325	-1.1879	0.359862	.....	0.5086
NAME 8	-1.07255	-2.16049	1.421758	.....	0.572681
NAME 9	1.20663	-2.04286	2.44527	.....	0.938943
NAME 10	-0.09642	-2.19015	-0.56786	.....	0.986837
:	:	:	:		:
:	:	:	:		:
:	:	:	:		:
NAME 1432	-1.20953	-1.54978	1.222617	.....	0.845859

FIG. 6

BUSINESS CATEGORY CODE	NAME	HIGH TECHNOLOGY
1	HIGH TECHNOLOGY	0.3
2	BANKING	0.25
3	BASIC MATERIAL MARKET CONDITION	0.2
4	CONSUMER ASSOCIATED	0.1
5	OTHER	0.15

FIG. 7

MINIMIZATION:  $x^T Q x / 2 + c^T x + d$

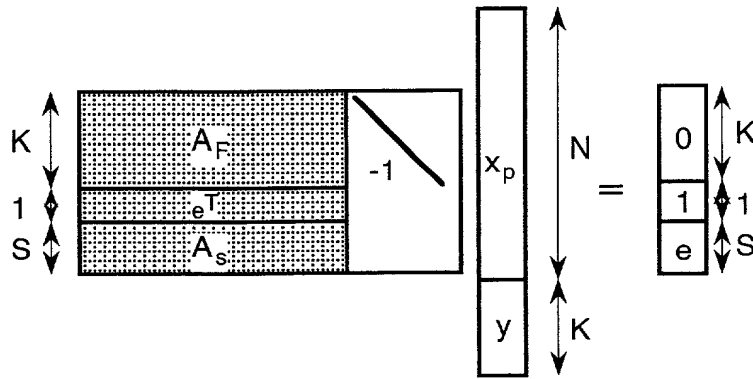


SECONDARY COEFFICIENT MATRIX :  $Q = 2 * \lambda * (\Delta + F)$   
 PRIMARY COEFFICIENT VECTOR :  $c_x = -\alpha - 2 * \lambda * h_m^T G$   
 CONSTANT TERM :  $d = \lambda * h_m^T G h_m$

N : NUMBER OF INDIVIDUAL NAME  
 K : NUMBER OF COMMON FACTOR

**FIG. 8**

(1) CONSTRAINT EXPRESSION :  $Ax=b$



FACTOR EXPOSURE RELATED CONSTRAINT :  $A_F h_p - y = 0$   
 CONSTRAINT ASSOCIATED WITH SUM OF INVESTMENT RATIO :  $e^T h_p = 1$   
 CONSTRAINT ASSOCIATED WITH INVESTMENT RATIO OF BUSINESS CATEGORY SECTOR :  $A_s h_p = e$

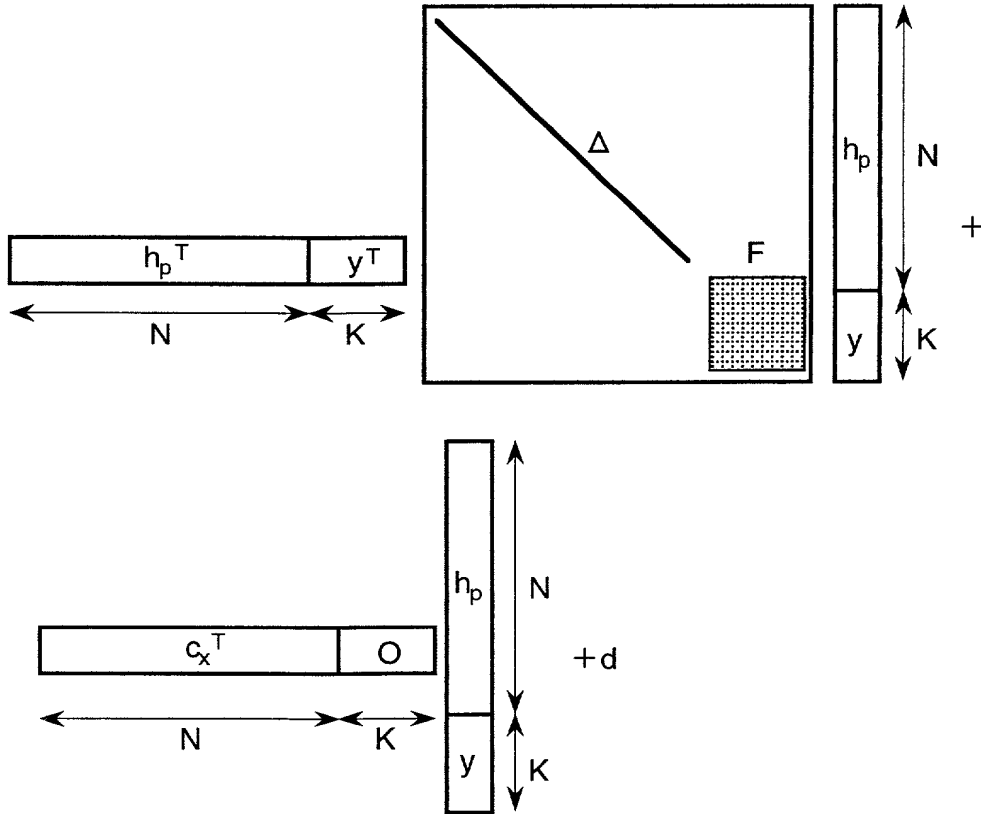
(2) NON-NEGATIVE CONSTRAINT :  $x \geq 0$

INVESTMENT RATIO OF INDIVIDUAL NAME :  $h_p \geq 0$   
 FACTOR EXPOSURE RELATED PARAMETER  $y$  :  
 NO NON-NEGATIVE CONSTRAINT  
 →APPLICATION TO INTERIOR METHOD IN PRESENT FORM IS IMPOSSIBLE

N : NUMBER OF INDIVIDUAL NAME  
 K : NUMBER OF COMMON FACTOR  
 S : NUMBER OF BUSINESS CATEGORY SECTOR

FIG. 9

MINIMIZATION:  $x^T Q x / 2 + c^T x + d$

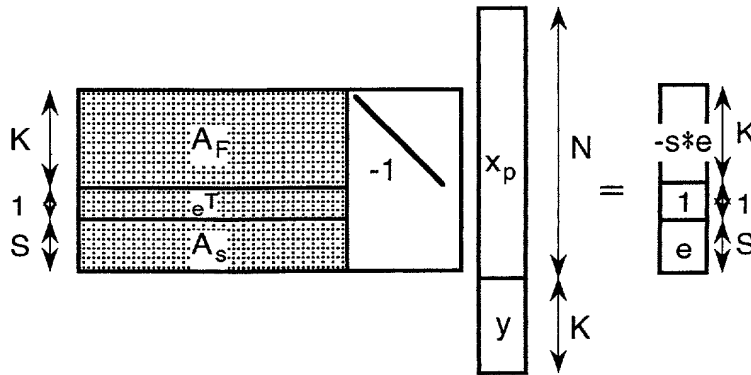


SECONDARY COEFFICIENT MATRIX :  $Q = 2 * \lambda * (\Delta + F)$   
 PRIMARY COEFFICIENT VECTOR :  $c_x = -\alpha - 2 * \lambda * x_m^T \Delta$   
 $c_y = -2 * s * e^T F$   
 CONSTANT TERM :  $Q = \lambda * (h_m^T G h_m + s^2 e^T G e)$

N : NUMBER OF INDIVIDUAL NAME  
 K : NUMBER OF COMMON FACTOR

FIG. 10

(1) CONSTRAINT EXPRESSION :  $Ax=b$



FACTOR EXPOSURE RELATED CONSTRAINT :  $A_F h_p - Y = -s * e$   
 CONSTRAINT ASSOCIATED WITH SUM OF INVESTMENT RATIO :  $e^T h_p = 1$   
 CONSTRAINT ASSOCIATED WITH INVESTMENT RATIO OF BUSINESS CATEGORY SECTOR :  $A_s h_p = e$

(2) NON-NEGATIVE CONSTRAINT :  $x \geq 0$

INVESTMENT RATIO OF INDIVIDUAL NAME :  $h_p \geq 0$   
 PARAMETER AFTER CONVERSION Y : FOR SUFFICIENTLY LARGE POSITIVE NUMBER  $s$   $Y \geq 0$   
 → INTERIOR METHOD IS APPLICABLE

N : NUMBER OF INDIVIDUAL NAME  
 K : NUMBER OF COMMON FACTOR  
 S : NUMBER OF BUSINESS CATEGORY SECTOR

FIG. 11

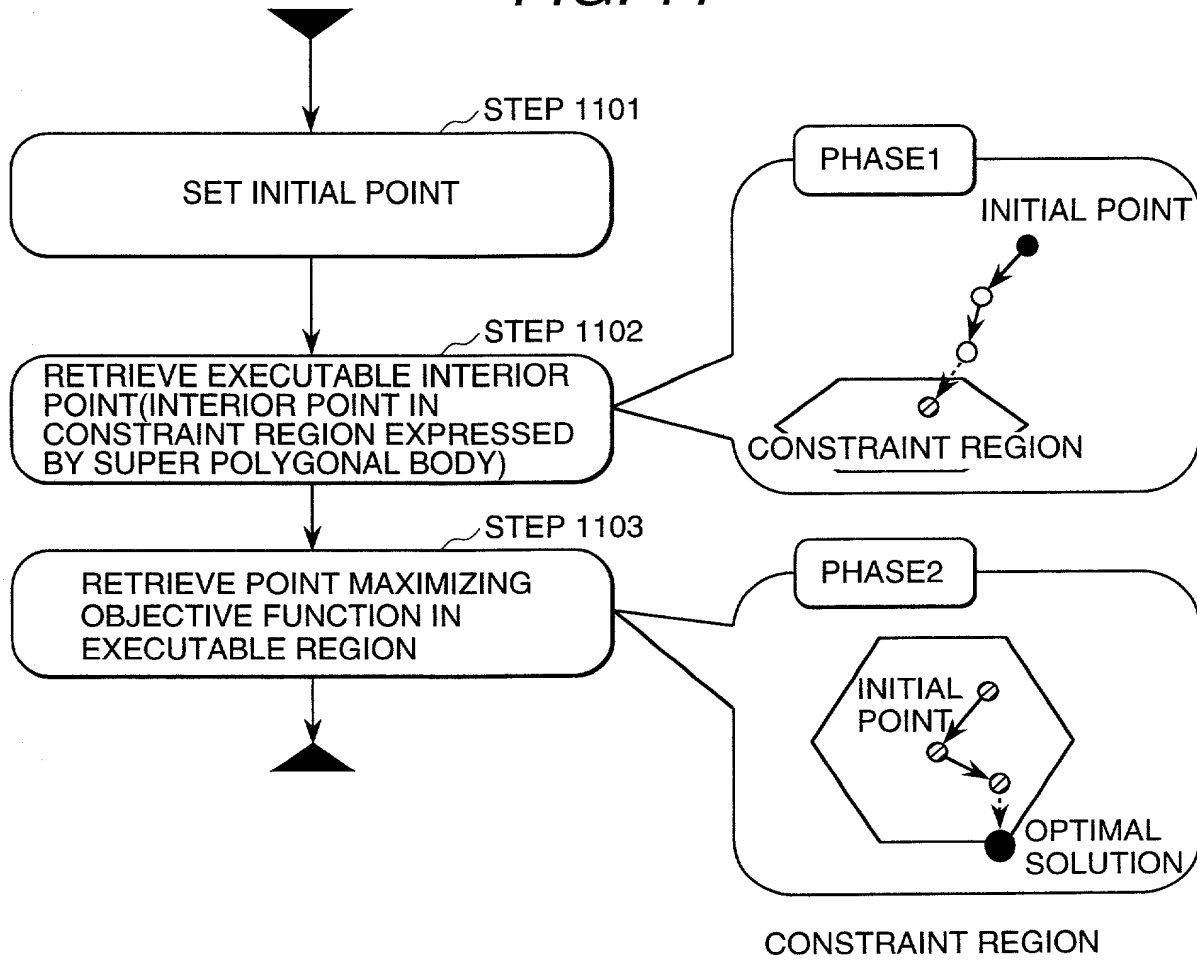


FIG. 13

〈 CALCULATION METHOD OF RIGHT SIDE VECTOR  $b - Ax_K$  OF MEWTON'S EQUATION (15) 〉

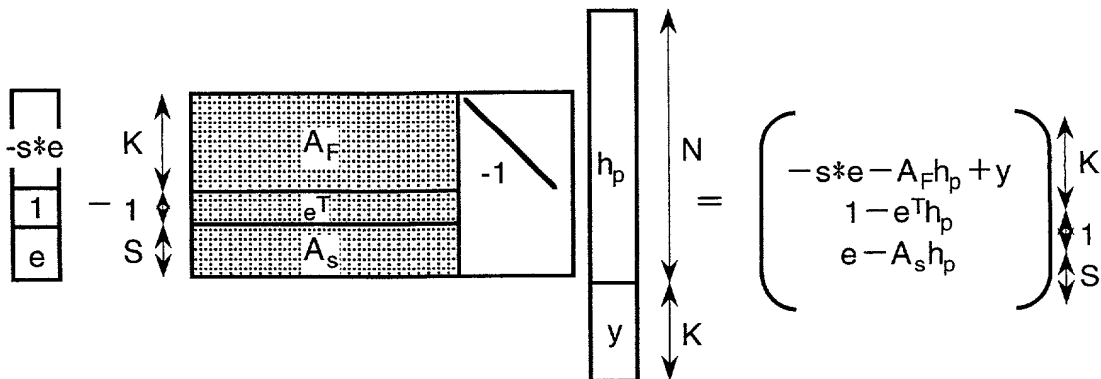
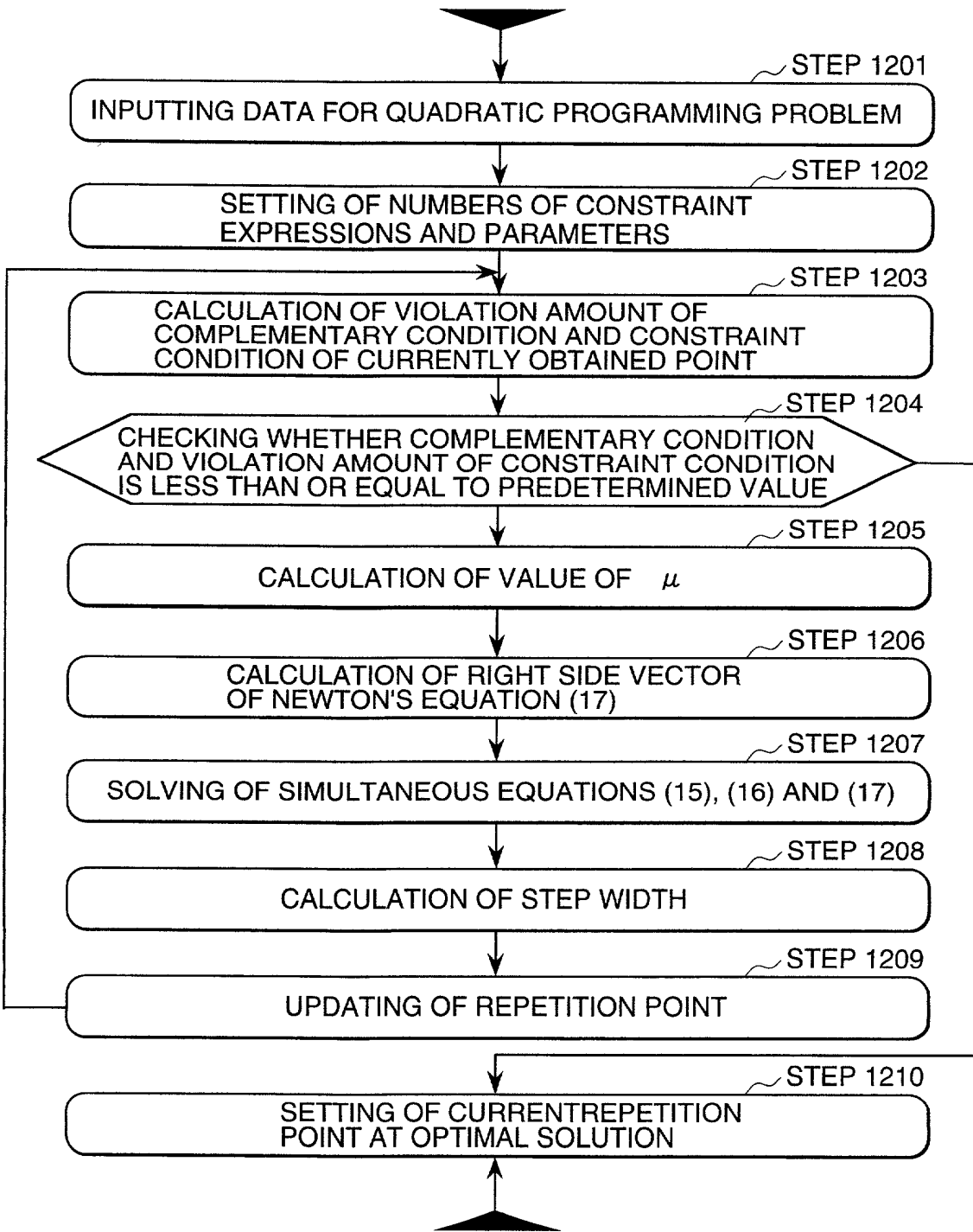


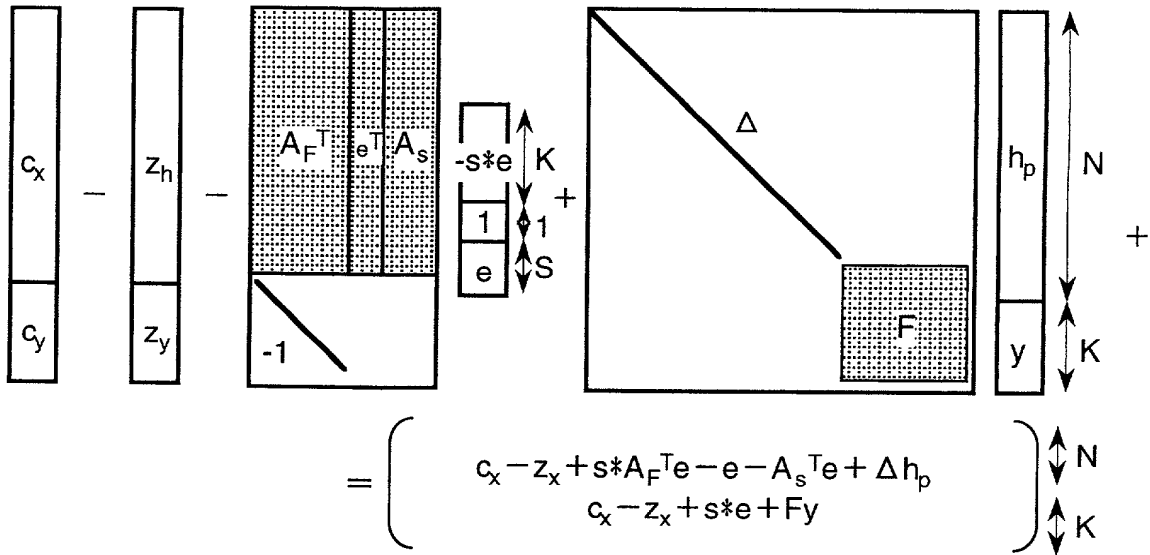


FIG. 12



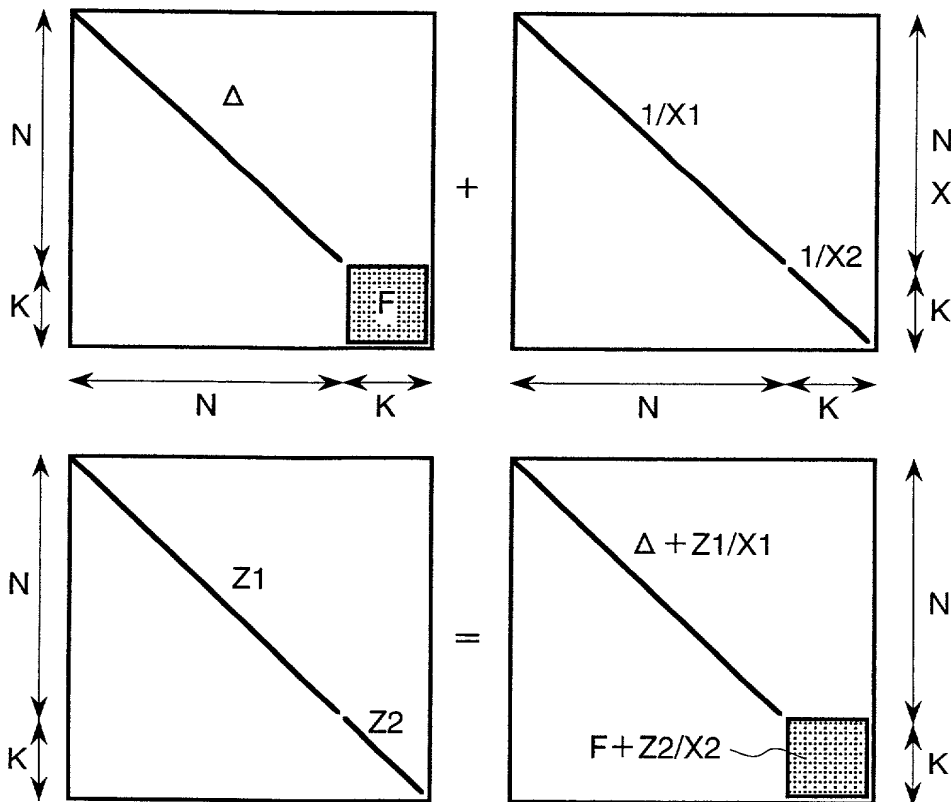
**FIG. 14**

〈 CALCULATION METHOD OF RIGHT SIDE VECTOR  $C - z_k - A^T y_k + Q x_k$  OF MEWTON'S EQUATION (16) 〉



**FIG. 15**

〈 MATRIX STRUCTURE OF  $Q + X^{-1}Z$  〉



X1 : DIAGONAL MATRIX FORMED WITH ELEMENT OF N-DIMENSION VECTOR  $x_1$   
 X2 : DIAGONAL MATRIX FORMED WITH ELEMENT OF N-DIMENSION VECTOR  $x_2$   
 Z1 : DIAGONAL MATRIX FORMED WITH ELEMENT OF N-DIMENSION VECTOR  $z_1$   
 Z2 : DIAGONAL MATRIX FORMED WITH ELEMENT OF N-DIMENSION VECTOR  $z_2$

FIG. 16

〈 CALCULATION 1 OF NEWTON'S EQUATION (18) 〉

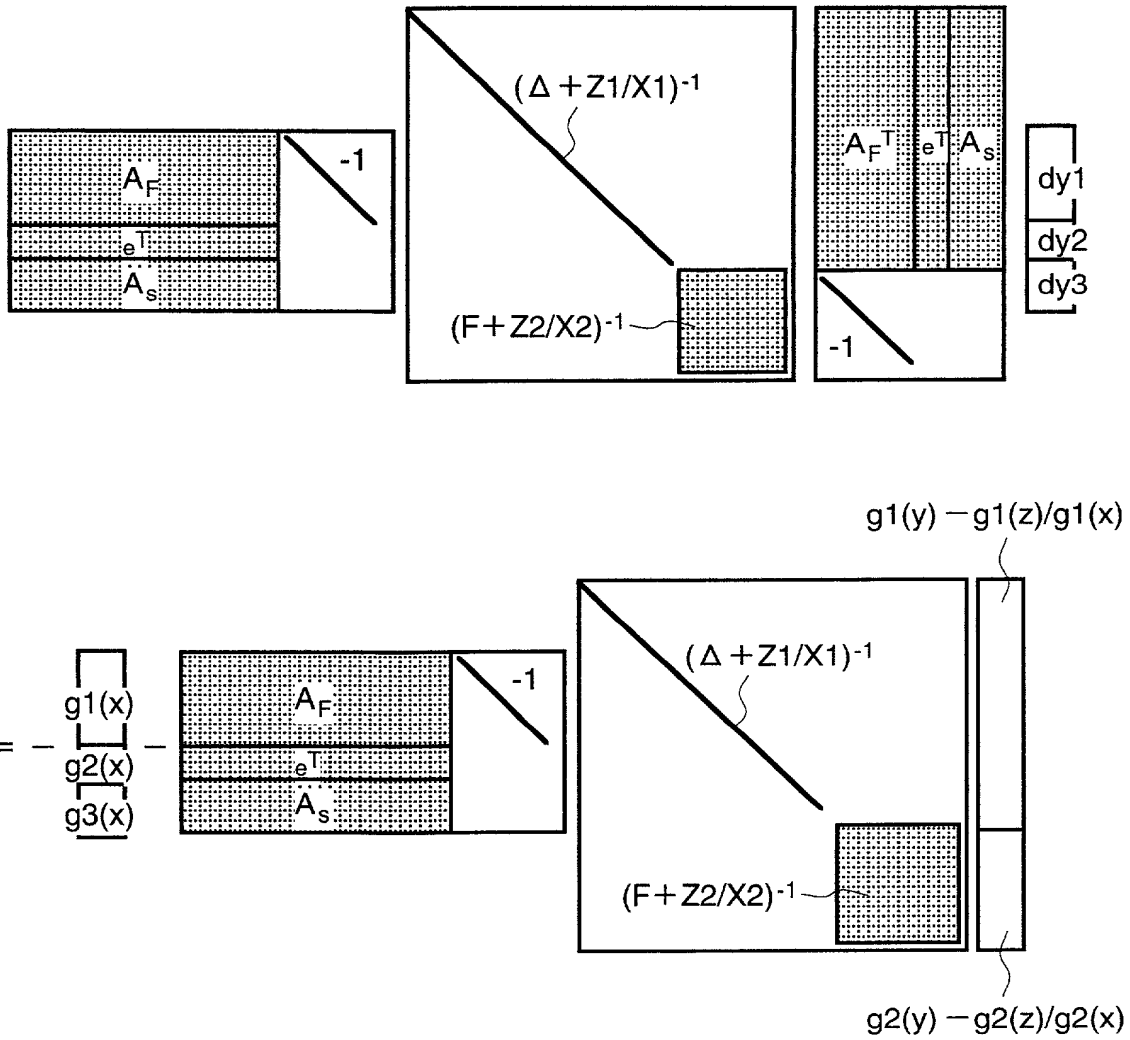
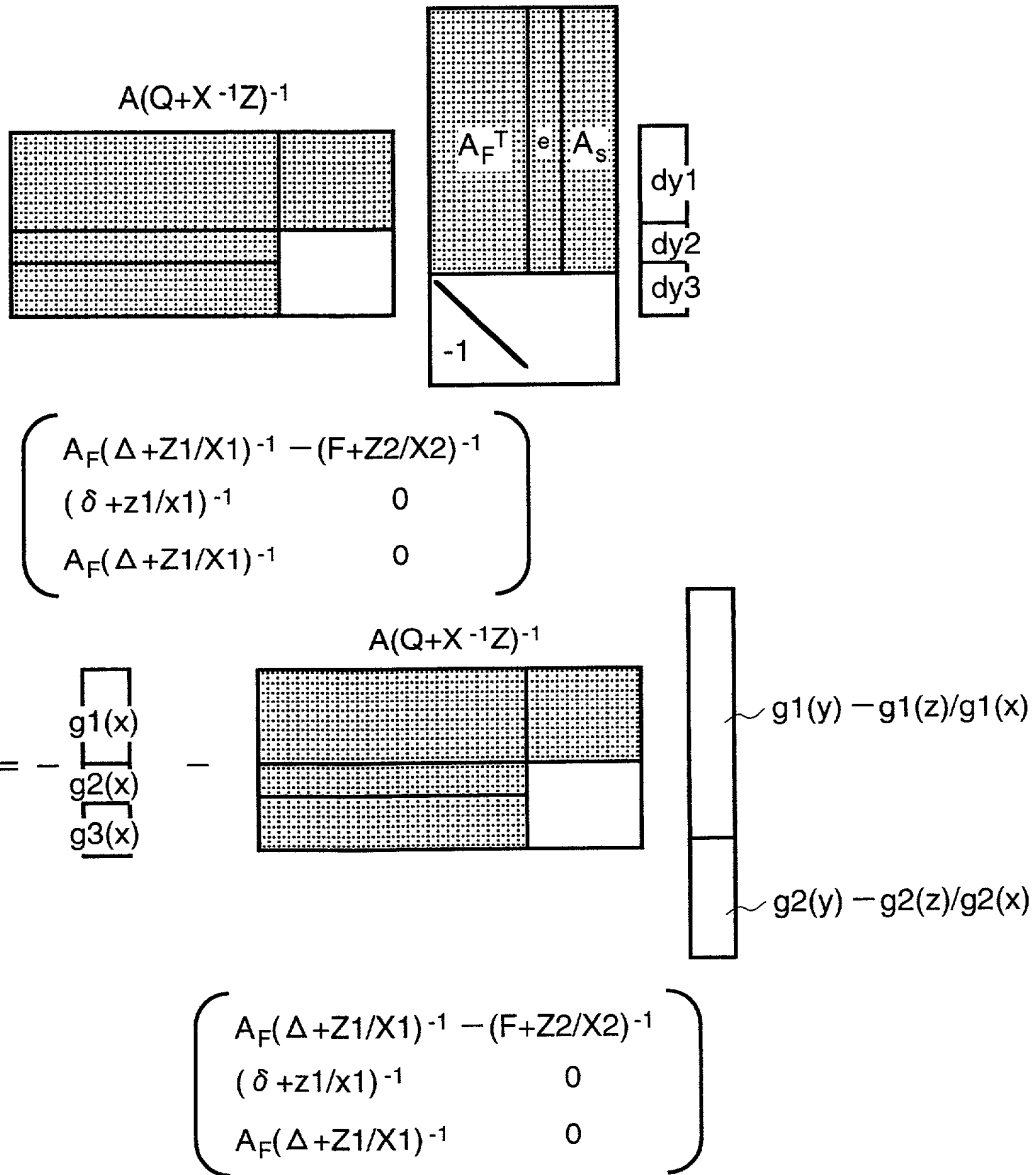


FIG. 17

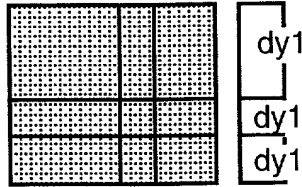
< CALCULATION 2 OF NEWTON'S EQUATION (18) >



$\delta$  : N-DIMENSIONAL VECTOR TAKING  
DIAGONAL MATRIX  $\Delta$  AS ELEMENT

**FIG. 18**

(CALCULATION 3 OF NEWTON'S EQUATION (18) )



$$\left( \begin{array}{ccc} A_F(\Delta + Z1/X1)^{-1}A_F^T + (F+Z2/X2)^{-1} (\delta + z1/x1)^{-T}A_F^T & A_F(\Delta + Z1/X1)^{-1}A_S^T & \\ A_F(\delta + z1/x1)^{-1} & (\delta + z1/x1)^{-T}e & (\delta + z1/x1)^{-T}A_S^T \\ A_S(\Delta + Z1/X1)^{-1}A_F^T & A_S(\delta + Z1/X1)^{-1} & A_S(\Delta + Z1/X1)^{-1}A_S^T \end{array} \right)$$

$$= \begin{pmatrix} -g1(x) - A_F(\Delta + Z1/X1)^{-1}\{g1(y) - g1(z)/g1(x)\} \\ - (F+Z2/X2)^{-1}\{g2(y) - g2(z)/g2(x)\} \\ -g2(x) - (\delta + z1/x1)^{-T}\{g1(y) - g1(z)/g1(x)\} \\ -g3(x) - A_S(\Delta + z1/x1)^{-1}\{g1(y) - g1(z)/g1(x)\} \end{pmatrix}$$

**FIG. 19**

NAME No	BUSINESS CATEGORY CODE	BUSINESS CATEGORY SECTOR	INVEST-MENT RATIO	SPECIFIC RISK	BENCH MARK RATIO	EXPECTED EARNING RATE [%]
1	2	3	0	31.48641	9.33E-05	0.8551
2	2	3	0	34.71193	0.000171	1.71835
3	2	3	0	40.61192	0.000167	0.4366
4	2	3	0	42.21049	7.96E-05	-0.7353
5	3	3	0	48.86621	9.23E-05	0.3597
6	3	3	0	26.89803	0.000298	-0.44415
:	:	:	:	:	:	:
:	:	:	:	:	:	:
:	:	:	:	:	:	:
40	5	4	0	35.7405	5.77E-05	3.8961
41	5	4	2.175	43.8456	0.0002	12.0823
42	5	4	0	56.8522	1.47E-05	3.7037
:	:	:	:	:	:	:
:	:	:	:	:	:	:
:	:	:	:	:	:	:
1432	25	3	0	87.4541	0.000175	0.2538

**FIG. 20**

NAME No	BUSINESS CATEGORY CODE	BUSINESS CATEGORY SECTOR	INVEST-MENT RATIO	SPECIFIC RISK	BENCH MARK RATIO	EXPECTED EARNING RATE [%]
41	5	4	2.175	44.81654	0.093241	12.91357
97	5	4	1.438051	49.50075	0.563199	11.91868
129	5	4	0.705988	32.77211	0.695341	9.521307
139	4	3	0.835106	53.1804	0.99132	7.39348
144	4	3	1.557042	23.78654	0.411831	4.983816
199	4	3	0.942459	45.63425	0.019441	3.457439
200	3	2	2.571606	46.83017	0.642707	13.3842
222	3	2	2.334634	37.6435	0.098	7.645901
234	3	2	2.935481	42.89463	0.347974	13.70963
301	10	2	2.041537	40.40644	0.432687	10.45938
:	:	:	:	:	:	:
:	:	:	:	:	:	:
:	:	:	:	:	:	:
1429	25	3	1.511036	92.07676	0.522114	3.447204

**FIG. 21**

NAME No	BUSINESS CATEGORY CODE	BUSINESS CATEGORY SECTOR	INVEST-MENT RATIO
41	5	4	2.175
97	5	4	1.438051
129	5	4	0.705988
139	4	3	0.835106
144	4	3	1.557042
199	4	3	0.942459
200	3	2	2.571606
222	3	2	2.334634
234	3	2	2.935481
301	10	2	2.041537
:	:	:	:
:	:	:	:
:	:	:	:
1429	25	3	1.511036

FIG. 22

